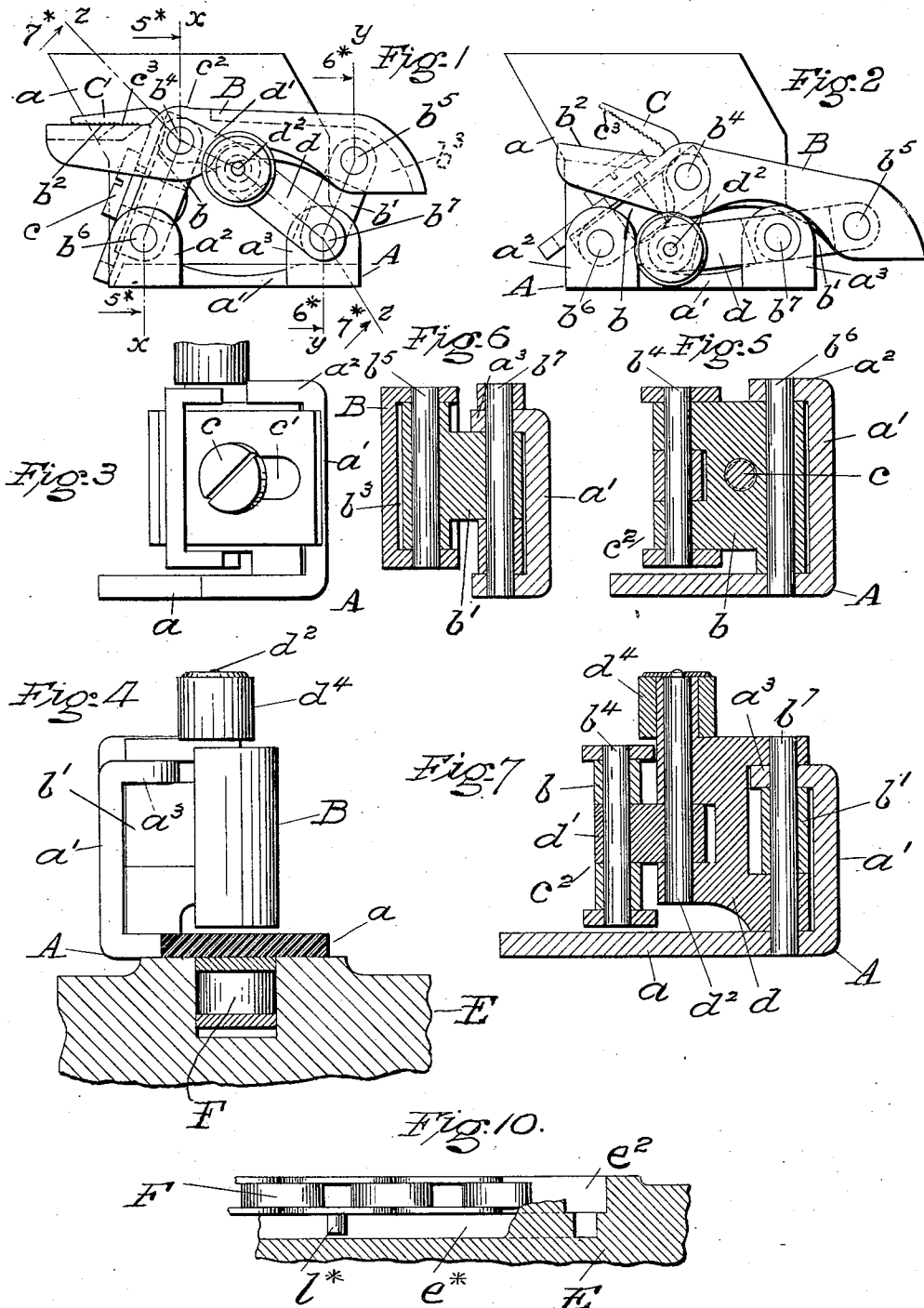


F. G. JAHN.
GRIPPER FOR PRINTING AND OTHER MECHANISM.
APPLICATION FILED JULY 31, 1909.

1,018,059.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 1.



Witnesses:

Charles C. Abbe
W. R. Reber,

Inventor

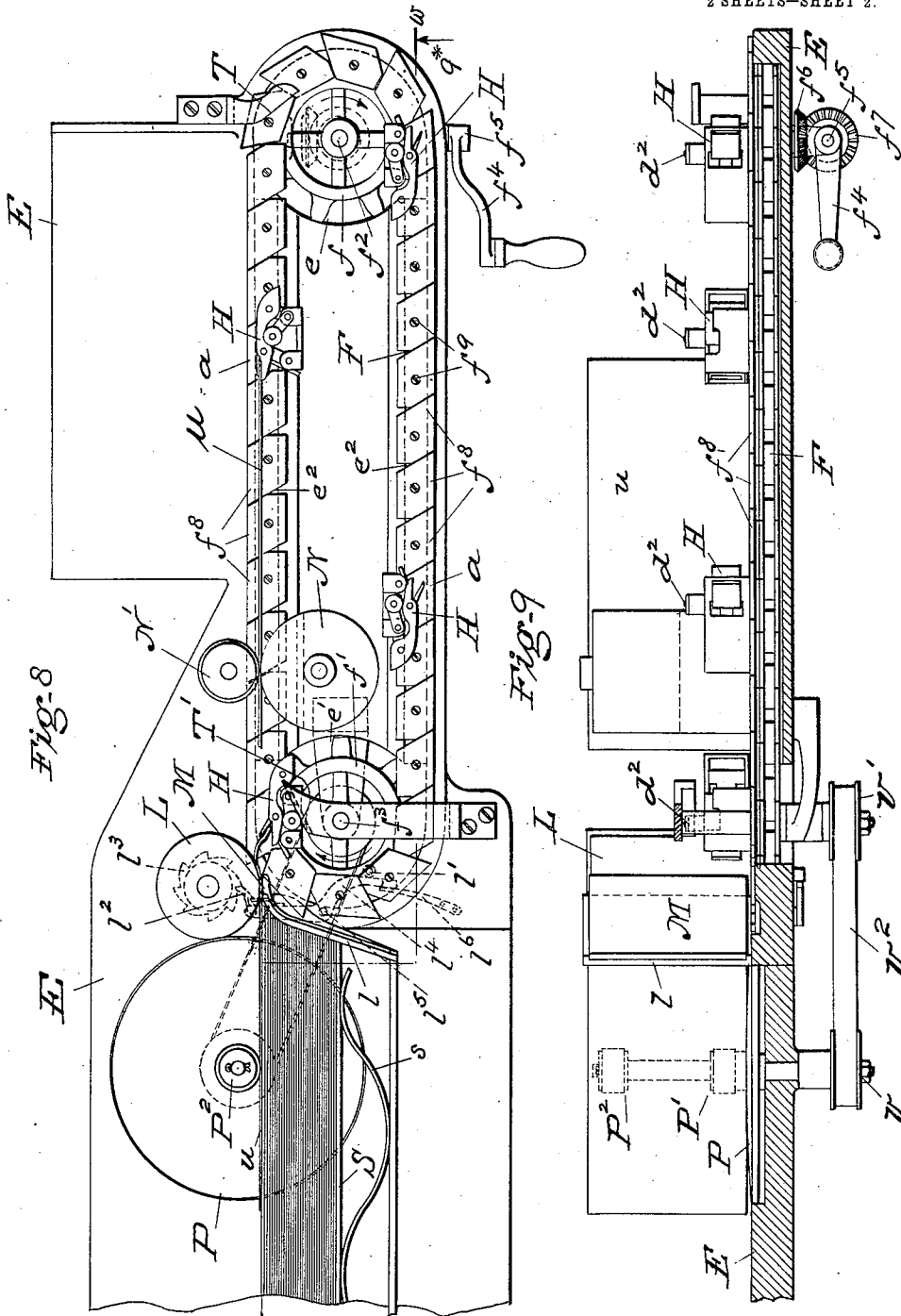
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UNITED STATES PATENT OFFICE.

FREDERICK G. JAHN, OF NEW YORK, N. Y., ASSIGNOR TO THE INTERNATIONAL POSTAL SUPPLY COMPANY OF NEW YORK, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

GRIPPER FOR PRINTING AND OTHER MECHANISM.

1,018,059.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed July 31, 1909. Serial No. 510,512.

To all whom it may concern:

Be it known that I, FREDERICK G. JAHN, a citizen of the United States, and a resident of the borough of Brooklyn, in the county of Kings and city and State of New York, have invented a certain new and useful Improvement in Grippers for Printing and other Mechanism, of which the following is a specification.

My invention, while capable of use in printing and other analogous machines, is designed for general application in locations where articles of various kinds are to be seized and grasped, one at a time, and subsequently released after having been either translated from one point to another, or held in a fixed position; the object of the invention being to provide a gripper of this character, which, while simple in construction and capable of a wide range of uses, shall, at the same time, be both positively operated and locked when in its closed position.

To these ends, the invention consists in certain peculiarities of construction and combination of parts, the embodiment of which that is preferred in practice is hereinafter first specifically described, and the distinguishing characteristics of the invention then pointed out in the subjoined claims.

Referring to the accompanying drawings, which form a part of this specification, Figure 1, is a plan view of a gripper constructed in accordance with one form of my invention, showing the parts in the position they occupy when the jaws are closed; Fig. 2, a similar plan view thereof, showing the parts in the position they occupy when the jaws are open; Fig. 3, a rear end elevation of the gripper, looking from the left in Fig. 1; Fig. 4, a rear end elevation of the same looking from the right in Fig. 1; Fig. 5, a vertical sectional elevation, taken in the line $x x$ of Fig. 1 and looking in the direction of the arrow 5* in that figure, with the various pivot pins shown in elevation; Fig. 6, a similar vertical section, taken in the line $y y$ of Fig. 1, and looking in the direction of the arrow 6* in that figure, with the various pivot pins likewise shown in elevation; Fig. 7, a vertical section taken in the line $z z$ of Fig. 1, and looking in the direction of the arrow 7* in that figure, with the various pivot pins similarly shown in elevation; Fig.

8 a diagrammatic plan view of a portion of a printing mechanism, showing my invention applied in connection therewith; Fig. 9, a longitudinal vertical section taken in the line $w w$ of Fig. 8, and looking in the direction of the arrow 9* in that figure, and Fig. 10 a longitudinal sectional detail of a portion of the top of the table, showing also a portion of the sprocket chain in side elevation.

In all the figures, like letters of reference are employed to designate corresponding parts.

A indicates the frame in and upon which the various parts of the gripper are mounted. This frame may be constructed in various forms, it only being essential, that, whatever its construction, it be adapted to receive the various parts of the gripper and be suited to the location in which it is to be employed. In the form of the invention which I have selected for purposes of illustration however, it is constructed of sheet metal, with an appropriately formed base a , by which it may be secured in place, and with a vertical portion a^1 , extending upward from one of its edges and provided at its top with overturned ears a^2 and a^3 . As thus constructed, this frame receives the respective jaws B and C, which are mounted therein through the intervention of links or radius bars b and b^1 . To permit of this mounting, the jaw B is constructed in the form of an approximately straight bar, of the proper dimensions to suit it to its intended use, and is provided at its forward end with an appropriate jaw surface b^2 , and with a longitudinal channel-way or recess b^3 formed in its under side for the accommodation of the links or radius bars when in their various positions. With the jaw B thus constructed, the links or radius bars b^1 and b^2 are respectively pivoted at their upper ends within the channel-way b^3 , by pivot pins b^4 and b^5 , which are passed through suitable orifices formed in the vertical walls of the channel-way or recess and through the respective links or radius bars, as shown in Figs. 5 and 6. As thus pivoted at their upper ends, these links or radius bars are respectively pivoted at their lower ends between the ears a^2 and a^3 and the base a of the frame A, by pivot pins b^6 and b^7 , which are respectively passed through ori-

fices formed in the ears a^2 and a^3 and base a , and through suitable orifices in the lower end of the links or radius bars, as likewise shown in Figs. 1 and 2. In being thus supported upon the frame A, the jaws B and C are capable of a swinging movement thereon, both longitudinally of the jaw B and laterally thereof toward and away from the upright portion a^1 of the frame A. While the jaw B is thus constructed in the form of a substantially straight bar, the jaw C is preferably formed of a thin plate in the shape of a bell-crank, and is supported in the frame A through the intervention of the link or radius bar b , to the outer face of which it is secured by a screw c , that passes through a suitable slot c^1 in its shank-like arm and engages at its free end with an appropriately threaded orifice formed in the link or radius bar, as shown in Figs. 3 and 5, whereby to render the jaw adjustable toward and away from its companion jaw B to adapt them to grip and operate on checks or other articles of different thicknesses. As thus secured in place, this jaw C extends upward through a suitably formed opening c^2 formed transversely in the jaw B, with its overturned portion so disposed with respect to the cooperating jaw surface b^2 , that when the jaws are swung forward on the links or radius bars to the limit of their movement in that direction, the surface c^3 thereon will be forced into contact with the surface b^2 of the jaw B, and the gripping or clamping of the article to be operated upon thereby effected, as shown in Fig. 1; while, when swung backward to the rearmost limit of their movement, the under surface c^3 of this overturned portion of the jaw C will be swung upward and away from the jaw surface b^2 and the article gripped between it and that surface released therefrom, as shown in Fig. 2.

For swinging the jaws B and C forward and backward upon the frame A, to thereby effect their clamping and releasing action, various means may be employed. I prefer however to adopt for the purpose toggle-members d and d^1 , which, jointed together at their inner ends by a pivot d^2 , are pivoted at one of their outer ends upon the pivot b^4 , and at their other end upon a pivot b^7 . As thus arranged, whenever the toggle-members are swung on their pivot pins d^2 to cause their flexure or folding action, the jaws will be drawn backward thereby by a positive action, and the jaw C swung upward away from the jaw B. On the other hand, when these toggle-members are swung in an opposite direction to extend or bring them into line, then the jaws will be swung forward on the links or radius bars in a positive manner, and the jaw C forced into contact with the jaw B. Thus, by merely folding and straightening out or extending

the toggle-members d and d^1 , the opening and closing of the jaws C and B are respectively effected; and, in order to provide for locking the jaws in their closed position, the toggle-members are so pivoted with respect to the frame A and the jaws, that, in being straightened or extended to swing the jaws forward and into closed position, the joint in which the pivot d^2 is located is capable of being swung slightly beyond a line joining the axis of the pivots b^4 and b^7 , as shown by dotted lines $z z$ in Fig. 1, in which position this joint is restrained from further movement in that direction by the jaws coming together and the positive locking of such jaws in their closed position thereby effected, as will be readily understood.

For folding or extending the toggle-members d and d^1 when the opening or closing of the jaws B and C is required, various means may be employed. I prefer however to accomplish that result through the pivot pin d^2 , which is extended upward some distance beyond the upper edge of the toggle-member d , whereby to be grasped by the fingers of the operator or by an appropriate mechanism arranged for the purpose, and is or may be provided with a friction sleeve d^4 by which to reduce the friction opposed by the pin when being operated. By this means, as will be seen, the ready folding or extension of the toggle-members may be effected by simply imparting an upward or downward movement to the stud d^2 , as the particular movement of the toggle-members may require.

In some instances the links or radius bars b and b^1 may both be made of the same length. In other instances, on the other hand, one of these links or radius bars may be made longer than the other, and in Fig. 1 I have shown the link or radius bar b made slightly longer than the link or radius bar b^1 , but this is unessential and both links or bars may be made of the same length or of different lengths, as may be preferred, or as the exigencies of the use of the gripper may demand. Again, in some instances the cooperating surfaces b^2 and c^3 of the respective jaws B and C may both be made smooth or serrated, or one may be made smooth and the other serrated, and in the drawings I have shown this last mentioned arrangement, but either the smooth or serrated, or a combination of the two, may be adopted and the jaws operate with efficiency.

With the gripper constructed and operating as above explained, it is adapted for use in a variety of locations, and in many different forms of machines. In Figs. 8 and 9 of the drawings however, I have shown it applied in connection with a printing mechanism, but this is merely illustrative, and the selection of this form of machine is a mere matter of convenience and is not in-

tended as a limitation of the use of the gripper thereto. In these last mentioned figures, E indicates the top of the table or stand of a printing mechanism, and F indicates a sprocket chain upon which the grippers are secured and by which they are carried. The top E may be constructed in any appropriate form that will adapt it to its intended use, and the sprocket chain F, which is or may be of any ordinary or preferred construction, is supported upon and carried by suitable sprocket wheels f and f^1 , that are respectively mounted on the upper ends of vertical shafts f^2 and f^3 , which extend upward through the top of the table, as shown. As thus arranged the grippers, which are identified in these Figs. 8 and 9 by the reference letter H, are secured to the upper surface of the chain F, and, extending upward therefrom are adapted to engage with and carry forward successive sheets of paper or other articles, as they are supplied one after another to them in succession. With the grippers H thus secured and carried, the sprocket wheels f and f^1 and the sprocket chain F, instead of extending upward above the upper surface of the table E, are preferably sunk below the same to the proper distance to bring the under surface of the frame A of the grippers in a plane flush therewith. To permit of this arrangement the top of the table E is preferably provided in its upper surface with recesses e and e^1 , for the reception of the respective sprocket wheels f and f^1 , and also with guide-ways e^2 , likewise formed therein, for the reception and guidance of the sprocket chain in traveling from one of the sprocket wheels to the other. For rotating the sprocket wheels f and f^1 , and through them for moving and operating the sprocket chain F, various means may be employed. In the drawings however I have shown this result accomplished by a crank or winch f^4 , through the intervention of a shaft f^5 and a pair of intermeshing bevel gears f^6 and f^7 , of which the gear f^6 is secured upon the vertical shaft f^2 , and the gear f^7 upon the shaft f^3 . With the sprocket chain thus arranged and operated, there may be employed any of the ordinary or approved forms of mechanism by which the succeeding sheets or other articles supplied in bulk or mass may be separated out therefrom, one after another, and supplied to the jaws of the grippers. In the mechanism which I have selected for purposes of illustration however, these separating devices consist of a roll L and a co-operating separator or wiper M, which are located slightly in rear of the sprocket wheel f^1 , with the roll either constructed of comparatively soft rubber or other similar material that will exert a frictional adhesive action upon the sheets or other articles to be operated upon, or with a covering of that

material when the body of the roll is constructed of metal or other rigid substances, while the separator M is constructed of a sheet or strip of similar material and is arranged with its overturned inner end in contact with the periphery of the roll L, when no sheet or other article is passing between them, in which position it is or may be supported and held by any appropriate means, as, for instance, by a suitably arranged holder Z, or otherwise. As thus employed the successive separation of the sheets or other articles from the mass and their delivery to the gripper jaws B and C is effected by imparting a rotary motion to the roll L. In order however to deliver the sheets or other articles at the proper times to enter between the jaws of the grippers, the rotation of the roller L, instead of being continuous is intermittent, and of a speed that is somewhat greater than that at which the grippers are caused to travel, whereby, when the grippers successively arrive at the proper point to receive and grip the forward ends of the successive sheets or other articles, the latter will be thrust forward between their jaws, as shown in Fig. 8. For imparting the required intermittent rotation to the roll L, any of the ordinary and well known forms of motion transmitting devices may be employed. In the drawings however it is shown imparted thereto either from a stud l^1 carried by the sprocket wheel f^1 , as in Figs. 1 and 2, or from a stud l^2 carried by the sprocket chain F, as in Fig. 10; and through the intermediaries of a pawl l^3 , a ratchet l^4 and a lever l^5 . To permit of this being accomplished, the ratchet l^3 is fixedly secured to the roll L, whereby the two are caused to rotate together, while the pawl l^2 , which engages at its free end with the teeth on the ratchet, is pivoted at its other end upon the upper end of the lever l^5 , that, in turn, is pivoted at or near its middle point upon a stud l^6 , which is so situated with respect to the stud l^1 as to bring the lower portion of the lever l^5 within the path of movement of such stud. As thus arranged and organized, whenever the stud l^1 , or l^2 in the rotation of the sprocket wheel f^1 , is carried past the lower portion of the lever l^5 the vibration of the lever in one direction will be effected, with the result that, through the pawl and ratchet, the roll L will be rotated through the proper arc to effect the required feeding of the sheet or other article being operated upon, the vibration of the lever in the return direction being effected through a spring l^7 , which, secured at one end to the top E, engages at its other with the lever l^5 , as shown. With the rotation of the roll L thus effected and the sheets or other articles to be operated upon presented to it, the roll at each succeeding rotative impulse will, through the adhesive action of

its periphery, engage with the sheet or other article disposed next to it and carry it forward past the separator or wiper and deposit its forward end between the jaws of its
 5 respective gripper, while the separator or wiper, through its adhesive action, will engage with the next succeeding sheet or other article and restrain it from being carried forward with the other, until the former is
 10 carried fully past the roll L, when such succeeding sheet will be forced into contact with the roll to be carried forward in turn by it, while the next succeeding sheet or other article is restrained by the separator
 15 or wiper as before explained, and so on. While thus the moving forward of the successive sheets or other articles and the deposition of their forward ends between the jaws of the grippers are effected, their subsequent forward movement is accomplished
 20 by the grippers as they are moved forward by the sprocket chain, their drawing from between the roll L and the separator or wiper M as the sheets or other articles are thus carried forward being permitted by
 25 the pawl and ratchet, which, while allowing of the free rotation of the roll in one direction, prevents it from rotating in the other. In being thus carried forward, the successive sheets or other articles are gripped at
 30 their forward ends and drawn or trailed behind their respective grippers, and thereby carried from the point of their delivery to and between the printing and impression
 35 members N and N¹ of the printing mechanism and thence to the place of their discharge, where they are released from the gripper and there allowed to rest upon the shelf-like portion O of the top E.
 40 In some instances but a single gripper will be carried by the sprocket chain F, while in other instances, a plurality of these grippers may be carried by it. When however a plurality of grippers are made use of, the
 45 distance between the succeeding grippers will be somewhat greater than the length of the sheets or other articles that are being operated upon; but whether a single gripper or a plurality of grippers is or are employed
 50 in connection with the sprocket chain, each of the grippers will be so related to the stud l¹ or l², in the sprocket wheel f¹ or sprocket chain F that upon the gripper arriving at the proper point to receive it, the roll L will
 55 be rotated to move forward the sheet or other article to be seized and carried by it and deposit its forward end between the jaws thereof.

For supporting the sheets or other articles and feeding them forward to the roll L and separator or wiper M, I find it desirable to employ a rotating disk P and one or more feeding rolls P¹ and P², which latter with the disk P, are fixedly secured to a vertical
 60 shaft P³, whereby to be rotated in unison

with it, and the former provided on their peripheries with a covering of comparatively soft rubber or other similar material that will exert a frictional adhesive action
 70 upon the sheets or other articles to be operated upon and thereby force them toward the point of delivery between the roll L and the separator or wiper M. As thus employed the sheets or other articles are deposited in bulk or masses upon the disk,
 75 and, standing up edgewise thereon, with one of their longitudinal edges resting upon the disk, are forced toward the feeding rolls P¹ P², with the front sheet or other article in contact with them, by a feed plate S, which
 80 is acted upon by a spring s, or other appropriate means as may be preferred. With the sheets or other articles thus disposed, they are carried forward toward the roll L and separator or wiper M, where they are
 85 all, with the exception of the front sheet or other article restrained in their travel by the separator or wiper holder Z. The front sheet or other article not thus restrained however, is carried forward by the feed rolls P¹ and
 90 P² between the roll L and the separator or wiper M, where it is engaged by the last mentioned roll and carried forward to the gripper H, which will have arrived at the proper point in its travel to receive it. Being
 95 thus delivered and seized by the gripper, the sheet or other article will be carried forward by it in its travel, while yet standing on one of its longitudinal edges; and, in order to afford a proper support for such
 100 sheet or other article in being thus carried forward, I find it convenient to provide the upper surface of the sprocket chain F with a series of plates f^s, which, with the base a of the gripper frame A, is constructed of
 105 such form and dimensions as to make practically a continuous surface throughout the length of the chain, and yet capable of traveling around the sprocket wheels f and f¹. As thus equipped a smooth plane surface is
 110 provided upon which the lower edges of the sheets or other articles may rest, and which, through the action of the rear acute angular ends of the individual plates upon the sheets or other articles, as they reach the
 115 place of delivery and are released from the grippers, will, as these plates are carried around the sprocket wheel f, force such sheet or other article outwardly upon the shelf-like portion O of the top E, where they are
 120 removed from the path of travel of the succeeding grippers as they arrive opposite them. In some instances these plates f^s may be constructed from metal or other appropriate material, and may be secured to the
 125 sprocket chain in any convenient manner. I prefer however to construct them of vulcanized fiber, and to secure them thereto by screws f^o or otherwise. While the successive sheets or other articles are thus sup-
 130

ported and delivered upon the shelf-like portion O of the top E, the opening and closing of the jaws B and C of the grippers, to respectively release their hold upon the 5 sheets or other articles carried by them, and seize the succeeding sheets or other articles delivered to them, may be effected by any appropriate means that will accomplish that end. In the form of the invention 10 which has been selected for purposes of illustration however, these results are accomplished by stationary cam surfaces T and T¹, of which the cam surface T is supported from the top or table E in proper 15 position to act upon the upwardly extending stud d^2 and press it inward, to thereby open the jaws and release the sheet or other article therefrom, when it arrives at its place of discharge. The cam surface T¹, on the 20 other hand, is similarly supported from the top or table in proper position to act upon said stud, when the gripper arrives at the proper point to receive the succeeding sheet or other article, to force it outward and 25 thereby close and lock the jaws upon the latter when thus delivered to them. As thus closed and locked upon the sheet or other article, the jaws will be positively held until, in being carried forward by the gripper between the printing and impression members 30 of the printing mechanism, they arrive at the place where the sheet or other article is to be delivered, when they will be opened or separated by the cam T, in which condition 35 they will remain until, in their further travel, the succeeding sheet or other article is delivered to them, when, in their further movement, they will be closed upon it by the cam T¹, and so on.

40 With the parts constructed and organized as above explained, not only is a gripper produced, which is simple in construction and capable of general application to various classes of machines, but a feeding and 45 delivery mechanism for printing machines also produced in which the gripper may be employed, as well.

While in the drawings I have shown, and in the foregoing described, a gripper that 50 is capable of general application, and a feeding and delivery mechanism in which it may be employed, I do not limit myself strictly to them, but reserve to myself the right to modify either or both in various 55 ways, without departing from the spirit of the invention. Again, while I have shown and described a mechanism in which the grippers extend upward from their carrier and are adapted to operate on sheets or 60 other articles that stand up edgewise on one of their longitudinal edges, I do not limit myself to such a construction, as it is obvious that the mechanism may be so arranged that the grippers may operate upon 65 sheets or other articles lying either upon

their faces or backs, without in any way departing from the essentials of the invention.

Having now described my invention, and specified certain of the ways in which it 70 is or may be carried into effect, I claim and desire to secure by Letters Patent of the United States,—

1. The combination, with a pair of movable jaws, a frame, and links or radius bars 75 by which the jaws are connected with the frame, of cooperating toggle members connected at one end with such frame and at its other end with one of the radius bars for opening and closing said jaws, substantially 80 as described.

2. The combination, with a pair of movable jaws, a frame, and links or radius bars jointed at one end to one of said jaws and 85 similarly jointed at its other end to said frame, of cooperating toggle members jointed together and connected at one end to such frame and at its other end with the outer extremity of one of the links or 90 radius bars for opening and closing said jaws, substantially as described.

3. The combination, with a pair of movable jaws, a frame, and links or radius bars by which the jaws are connected with the 95 frame pivoted at one of their ends in said frame and having one of the jaws adjustably secured upon one of such links or radius bars and the other jaw pivotally supported upon their outer ends, of cooperating 100 toggle members jointed together and connected at one end with said frame and at the other end with one of the links or radius bars for opening and closing said 105 jaws, substantially as described.

4. The combination, with a gripper having a plurality of movable jaws, and means 110 by which the jaws are positively opened and closed and by which they are positively locked when in a closed position, of a sprocket chain upon which it is mounted 115 and carried, sprocket wheels upon which the sprocket chain is supported and operated, mechanism for imparting a back and forth longitudinal movement to such jaws upon 120 the sprocket chain and mechanism for delivering a sheet or other article and depositing one of its ends or boundaries in the jaws of said gripper advanced to receive it, and a series of plates secured to said sprocket chain, whereby to furnish a support 125 for the sheet or other article engaged by the gripper, substantially as described.

5. The combination, with a gripper having a plurality of movable jaws, and means 130 by which the jaws are positively opened and closed and by which they are positively locked when in a closed position, of a sprocket chain upon which it is mounted and carried, sprocket wheels upon which the sprocket chain is supported and oper- 135

ated, mechanism for imparting a back and forth longitudinal movement to such jaws upon the sprocket chain and mechanism for delivering a sheet or other article and de-
5 positing one of its ends or boundaries in the jaws of said gripper advanced to receive it, a series of plates secured to said sprocket chain, whereby to furnish a support for the sheet or other article engaged
10 by the gripper, and means for imparting

rotary motion to one of said sprocket wheels, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses this 27th day of July, 1909.

FREDERICK G. JAHN.

Witnesses:

WM. H. APPLETON,
WARREN C. FRENCH, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
